

CLAIMS

1. A constant velocity universal joint comprising: an
outer member which is provided with a spherical inner
5 surface in which a plurality of track grooves are formed;
an inner member which is provided with a spherical outer
surface in which a plurality of track grooves are formed,
balls disposed in a wedge-shaped ball track which is formed
by the synergy between the track groove of the outer member
10 and the track groove of the inner member; and a retainer
disposed between the spherical inner surface of the outer
member and the spherical outer surface of the inner member
to hold the balls, wherein elastic pressure is applied in
an axial direction so as to separate the inner member and
15 the retainer, and a ratio $r1 (= PCD_{BALL}/D_{BALL})$ of a pitch
circle diameter (PCD_{BALL}) of the ball to a diameter (D_{BALL})
of the ball is in a range of $1.5 \leq r1 \leq 4.0$.

2. A constant velocity universal joint according to
20 claim 1, wherein a ratio $r2 (= D_{OUTER}/PCD_{SERR})$ of an outside
diameter (D_{OUTER}) of the outer joint member to a pitch
circle diameter (PCD_{SERR}) of teeth of the inner member is in
a range of $3.0 \leq r2 \leq 5.0$.

25 3. A constant velocity universal joint according to

claim 1 or 2, wherein, when a ratio R1 is defined by F/PCR where F is an offset amount of inner/outer member (offset amount between the center of the track with respect to a center of inner/outer spherical surface) and PCR is a length of a segment connecting the center of the track and the center of the ball, the ratio R1 ($= F/PCR$) is in a range of $0.109 \leq R1 \leq 0.162$.

4. A constant velocity universal joint according to any of claims 1 to 3, wherein the number of the torque transmission balls is equal to or less than six, and a contact angle (θ) between the track and the ball is in a range of $30^\circ \leq \theta \leq 40^\circ$.

5. A constant velocity universal joint according to claim 1, wherein: the ball track is open to one of axial directions in the shape of a wedge; a pocket of the retainer has corner round sections; and a ratio (R/d) between a radius of curvature R of the corner round section and a diameter d of the torque transmission ball is $R/d \geq 0.22$.

6. A constant velocity universal joint according to claim 5, wherein the ratio (R/d) between the radius of curvature R of the corner round section and the diameter d

of the torque transmission ball is $0.45 \leq R/d \leq 0.62$.

7. A constant velocity universal joint for steering according to claim 5 or 6, wherein lengths of a plurality of pockets corresponding to a plurality of the track grooves in a circumferential direction of a window are all equal.

8. A constant velocity universal joint comprising: an outer member which is provided with a spherical inner surface in which a plurality of track grooves are formed; an inner member which is provided with a spherical outer surface in which a plurality of track grooves are formed; balls disposed in a wedge-shaped ball track which is formed by the synergy between the track groove of the outer member and the track groove of the inner member; and a retainer disposed between the spherical inner surface of the outer member and the spherical outer surface of the inner joint member to hold the balls, the ball always making contact with the ball track by preload applying means, wherein

the ball track is open to one of axial directions in the shape of a wedge, a pocket of the retainer has corner round sections, and a ratio (R/d) between a radius of curvature R of the corner round section and a diameter d of the torque transmission ball is $R/d \geq 0.22$.

9. A constant velocity universal joint according to claim 8, wherein the ratio (R/d) between the radius of curvature R of the corner round section and the diameter d of the torque transmission ball is $0.45 \leq R/d \leq 0.62$.

10. A constant velocity universal joint for steering according to claim 8 or 9, wherein lengths of a plurality of pockets corresponding to a plurality of the track grooves in a circumferential direction of a window are all equal.